

What is claimed is:

1. An infrared image sensor comprising:

a semiconductor substrate;

a sensor array composed of a plurality of sensor elements provided on the semiconductor substrate for respectively providing thermal image data by receiving infrared radiation from a measurement member to measure a temperature of the measurement member; and

a plurality of temperature compensation elements provided on the semiconductor substrate, each of the plurality of temperature compensation elements being arranged to be adjacent to or to overlap with a corresponding one of the plurality of sensor elements, for performing temperature correction to an output of the corresponding one of the plurality of sensor elements.

2. The infrared image sensor according to claim 1, wherein:

each of the plurality of sensor elements is formed with a through hole passing through the semiconductor substrate from an irradiation surface of the semiconductor substrate, on which the infrared radiation is incident, to a non-irradiation surface of the semiconductor substrate at an opposite side of the irradiation surface; and

the plurality of temperature compensation elements are provided on the non-irradiation surface of the semiconductor substrate.

3. The infrared image sensor according to claim 2, wherein

each of the plurality of temperature compensation elements is provided above a recess that is formed on the non-irradiation surface of the semiconductor substrate.

4. The infrared image sensor according to claim 2, wherein first and second sensor elements of the plurality of sensor elements, arranged adjacently to each other, respectively have through holes, opening portions of which are adjacent to each other on the irradiation surface of the semiconductor substrate.

5. The infrared image sensor according to claim 4, further comprising a condenser lens disposed between the semiconductor substrate and the measurement member for condensing the infrared radiation from the measurement member onto the sensor array, wherein:

imaging regions by the condenser lens for the first and second sensor elements correspond to the opening portions of the first and second sensor elements.

6. The infrared image sensor according to claim 2, wherein a side surface of the through hole is coated with a high-reflectance film.

7. The infrared image sensor according to claim 1, wherein each of the plurality of sensor elements and the plurality of temperature compensation elements has a membrane structure.

8. The infrared image sensor according to claim 1, wherein an area of the each temperature compensation element is smaller than that of the corresponding one of the plurality of sensor elements.

9. The infrared image sensor according to claim 1, wherein the each temperature compensation element is disposed at a downstream side of the corresponding one of the plurality of sensor elements in an incident direction of the infrared radiation to the semiconductor substrate.

10. The infrared image sensor according to claim 9, wherein a gap is defined between the each temperature compensation element and the corresponding one of the sensor elements.

11. The infrared image sensor according to claim 1, wherein the each temperature compensation element performs the temperature correction to the output of the corresponding one of the sensor elements, based on a difference between an output of the each temperature compensation element and the output of the corresponding one of the sensor elements.

12. An infrared image sensor comprising:

a semiconductor substrate;

a sensor array disposed on the semiconductor substrate and composed of a plurality of blocks, each of which is composed of a plurality of sensor elements respectively for providing thermal

image data by receiving infrared radiation from a measurement member to measure a temperature of the measurement member; and

a plurality of temperature compensation elements provided on the semiconductor substrate, each of the plurality of temperature compensation elements being arranged adjacently to a corresponding one of the plurality of blocks, for performing temperature correction to outputs from the plurality of sensor elements.

13. The infrared image sensor according to claim 12, wherein:

the semiconductor substrate has an irradiation surface on which the infrared radiation is incident and a non-irradiation surface on an opposite side of the irradiation surface; and

the plurality of temperature compensation elements are provided on the non-irradiation surface so that the infrared radiation is prevented from entering the plurality of temperature compensation elements.

14. The infrared image sensor according to claim 12, wherein:

the semiconductor substrate has an irradiation surface on which the infrared radiation is incident and a non-irradiation surface on an opposite side of the irradiation surface; and

each of the plurality of sensor elements has a through hole opening on the irradiation surface of the semiconductor substrate for receiving the infrared radiation, and a resistor at a bottom

of the through hole, the resistor having a resistance that is changed by the infrared radiation.

15. The infrared image sensor according to claim 13, wherein the through hole is tapered toward the resistor.

16. The infrared image sensor according to claim 13, wherein a side surface of the through hole is coated with a high-reflectance film for reflecting the infrared radiation.